Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Lab table # \_\_\_\_\_ at: 12:00 / 3:00 / 6:00

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Part A

Fill in the table below:

|  |  |  |
| --- | --- | --- |
| **Lens** | **Nominal focal  length (mm)** | **Measured focal  length (mm)** |
| **1** | 100 |  |
| **2** | 200 |  |
| **3** | 250 |  |

# Part B

Fill in the table below. Measure the distance *x* (or *L*) from the *front face* of the light source to the center of the lens (or surface of the screen). Also record the height of the image.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **1st location** | | **2nd location** | |
| ***L* (cm)** | ***f* (cm)** | **x1 (cm)** | **h1 (cm)** | **x2 (cm)** | **h1 (cm)** |
| **105** | **10** |  |  |  |  |
| **20** |  |  |  |  |
| **25** |  |  |  |  |
| **90** | **10** |  |  |  |  |
| **20** |  |  |  |  |
| **25** |  |  |  |  |

Original size of the source object: h0 (cm) = \_\_\_\_\_\_\_

# Part C

Plot the data from the Part B table: the focal length *f* vs the lens position *x*. Derive a relationship between *f*, *L* and *x*. To your data graph, add a plot of this function *f*(*x*; *L*) for the two values of *L* that we used in this lab (*L* = 90 cm and *L* = 105 cm).

# Questions

Make sure you answer all the questions here.